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ON CHOLERA,

MORE ESPECIALLY AS IT HAS OCCURRED
DURING LATE YEARS

IN

BRITISH INDIA,

A LETTER

ADDRESSED TO

SIR JAMES MCGRIGOR, M. D.

DIRECTOR GENERAL OF THE MEDICAL DEPARTMENT OF THE
ARMY, &c. &c.

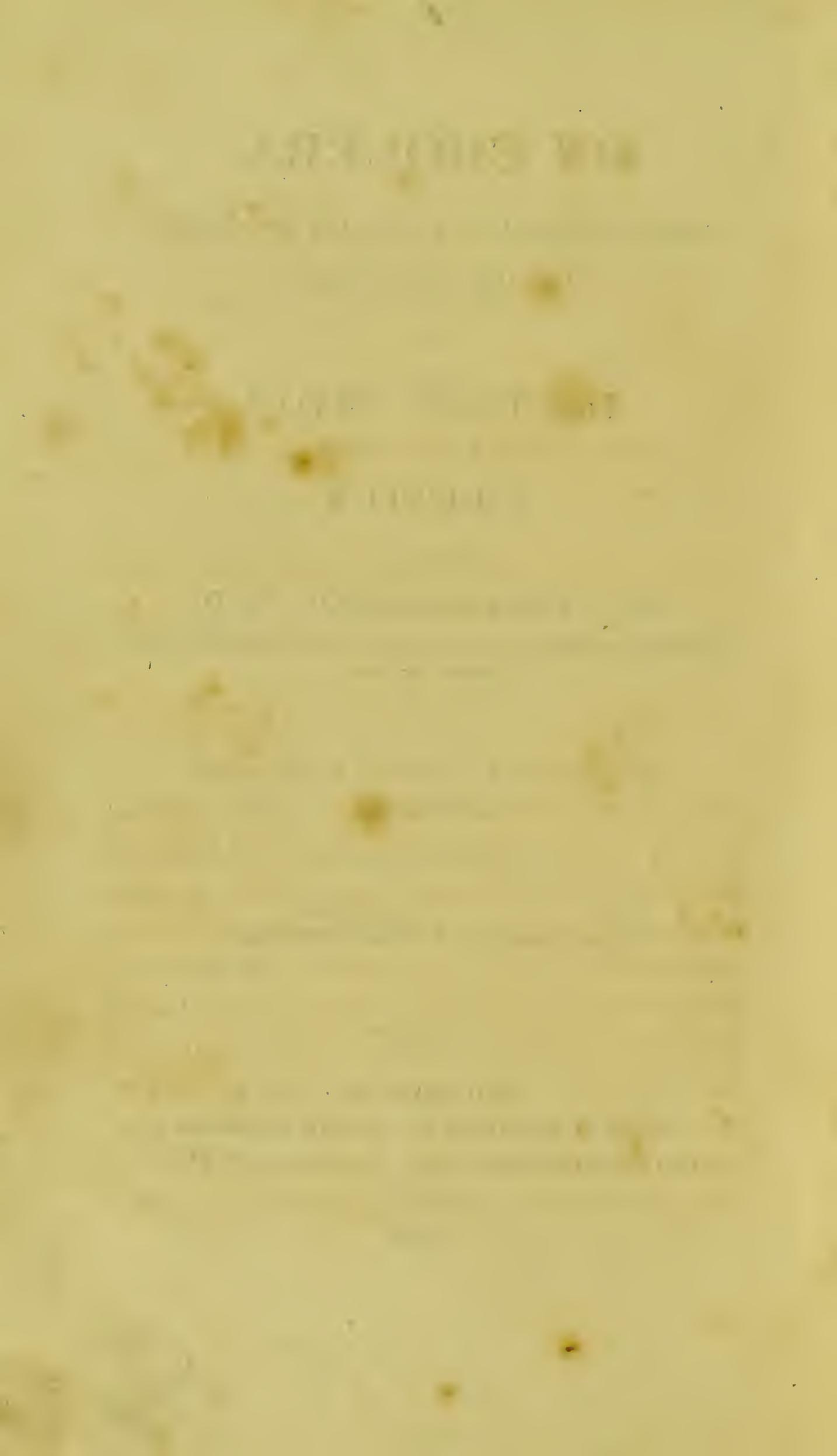
By THOMAS BROWN, SURGEON,
MUSSELCBURGH.

Crudelis ubique
Luctus, ubique pavor, et plurima mortis imago.
VIRGIL.

EDINBURGH:

PRINTED FOR ADAM BLACK, NORTH BRIDGE;
AND LONGMAN AND CO. AND T. AND G. UNDERWOOD,
LONDON.

1824.



TO

SIR JAMES M^CGRIGOR, M.D.

&c. &c.

**DIRECTOR GENERAL OF THE MEDICAL DEPARTMENT OF THE
ARMY, &c. &c.**

SIR,

WHEN the different histories of the disease known by the name of Cholera, and Cholera Morbus, or, as it has been lately termed, Cholera Spasmodica, together with the undecided views of the most proper mode of treatment, first reached this country from India, I intended offering a full account of it as it had occurred to me here, and also to inquire how far it is possible to arrive at some distinct and definite idea concerning the influence of warm climates on the human body.

Finding, however, my time would not permit me to enter upon a discussion of the subject so fully as I could have wished, and, at the same time, entertaining no doubt that, in a very short period, the whole phenomena and treatment of the disease would be completely illustrated and established, I deferred my intention ; but as this very desirable event appears to me never to have arrived, and indeed, from recent accounts, to be nearly as distant as ever, I have been tempted to offer the following observations for your consideration. I hope it will not appear altogether presumptuous in an individual, situated in so northern a latitude, to attempt explaining the nature of this disease, and offering directions for its treatment, when I inform you, that in 1796, 1798, and in 1800, I witnessed this disorder so general and so violent, as to call to it my particular attention, and it has given me much pleasure and satisfaction to find, that the view of the disease I then took, and the treatment which it consequently led me to follow, have been *ultimately* found most beneficial in combating the Cholera of India.

Were I, Sir, at this distance of time, to hazard a guess at the number of cases of this most alarming disorder, which I might have had the management of in those and succeeding years, I am sure it is much below the mark when I state them about 300. These were confined chiefly to the months of July and August in each year, and were attended with such an uniformity in every leading feature, that so distinct an impression was made on my mind, not only of the nature and causes of Cholera, but of the diseases of warm climates in general, that I have repeatedly written out directions for those young gentlemen that were intrusted to my care, before their joining the army or navy, pointing out, in the strongest terms, that I considered the peculiarities of the diseases of warm climates to be almost entirely attributable to the influence of the heat upon the biliary system, and that all their fevers possessed more of an endemic than of an epidemic character ; and in every future communication with these gentlemen, I had the pleasure to find they entirely acquiesced with my sentiments.

I do not consider it necessary to enter into any detail of the symptoms which existed in the *endemics*, to which I allude ; suffice it here to observe, that in every respect they resembled the endemics of India, every symptom showing itself to the same extent there described ; and certainly, to see a patient under the full diseased action of cholera, is one of the most distressing situations which a medical practitioner is ever called upon to witness. The constant action of retching and vomiting, the incessant inclination to go to stool ; and these, accompanied with the most severe and extensive spasms, produce such an effect upon the wretched patient, as speedily to throw him into the most urgent state of distress, despair, and danger, and to astonish and alarm every one around him. When the symptoms have reached this climax, the necessity for relief becomes so pressing, that in general no time is lost in applying for medical aid ; yet I have seen the patient when I reached him, which was frequently within two hours from the attack of vomiting and purging, so much exhausted,

that the power of articulation was lost,—the pulse scarcely perceptible at the wrist,—the eyes sunk in their sockets,—the countenance ghastly, and the extremities cold. Under all these circumstances, I was so fortunate as only to lose one; and the event in that case I attribute to an emetic, which had been very improperly exhibited before I saw the patient, and the bad effects of which I found it impossible to counteract. The success of my practice in these endemics, I consider as owing to the view of the disease, which I instantly took on its first appearance, and the method of combating it, to which that view necessarily led me.

In almost every case I was called to, the disease had, by the time I reached the bedside, produced such a change on the vital powers of the system, as instantly to suggest to me, that whether or not the excessive evacuations had been occasioned by any morbific matter, or offending cause introduced into the stomach and intestinal canal, such offending cause, it was more than probable, had been already carried off, and these violent diseased actions only carried on from the effect of habit or

sympathy. At all events, for the present, there could only be one indication, viz. to put a stop *quam primum* to the vomiting and purging, the effects of which were already but too visible, in their having exhausted the patient, and left him nearly *in articulo mortis*. My experience in cases of urgent retching had already taught me a decided predilection for opium in a solid form, before I had seen Cholera spasmodica ; and the pressing emergency of the patient's situation, at once induced me to administer it here. Its success answered my most sanguine expectations, indeed so much so, as to form my entire *ratio medendi*, so far as medical interference was necessary ; though, in order to give the patient and those around him, a confidence that nothing was omitted which could alleviate such intensity of suffering, I also prescribed a mixture composed of weak Aq. cinnamomi, carb. magnesia, and a proper quantity of Sacch. album, together with an embrocation of Tinct. saponis in opio, to rub the parts affected with spasm. These means, along with my directing the drinks, and general management of the patient, proved

uniformly successful ; and in an hour from the exhibition of the opiate, he was restored to a state of ease and security ; so much so, as to be in a few hours more almost convalescent. In the years to which I have alluded, the disease was so very prevalent, that for some time after the breaking out of the endemic, I was repeatedly disturbed every night to go out ; but at last, both my patients and myself became so familiar with the disease and the remedy, that I was only requested to send the *pill* and *bottle*.

I have already observed, Sir, that upon viewing the patient's situation, all idea of using remedies for promoting farther evacuation, either by vomiting or purging, was immediately abandoned, and struck me as not only being quite unnecessary, but as likely to prove highly prejudicial ; the only indication being, if possible, to put a stop to the retching and discharge by stool, as the whole danger and distress of the patient were to be attributed to the excess of these actions, the continued violence of the symptoms appearing to me to have reduced the indivi-

dual to a state exactly the same as is produced by any cause occasioning *hypercatharsis*.

From this very obvious state of my patient, I did not hesitate a moment to put an opium pill of two grains into his mouth, and endeavoured to get it over with the least possible quantity of brandy and cold water, giving it only by tea-spoonfuls at a time. I seldom failed in getting the opium over in some way or other ; for if the patient could not readily swallow it whole as a pill, I desired him to chew or suck it, gradually washing it out of the mouth by tea-spoonfuls of cold water ; and I have frequently observed, not only all the benefit was obtained which could be expected from the swallowing of the opiate at once, but the risk of having it rejected entirely avoided, while the sedative effects gradually extended from the fauces to the stomach.

I may also mention, in passing, that in affections of the stomach and bowels consequent upon weaning brash, and in other diseases of children, where the administration of opium in a simple solid form has been

found impracticable, I have been in the habit of successfully introducing it in the more agreeable form of lozenge, solely composed of the opium, in combination with extract of liquorice.

But to return.—Upon getting the opium over, I remained with my patient for more than half an hour, entirely with the view of preventing his thirst being satisfied in the way that he would wish, and in the way that the attendants would but too readily acquiesce in; for if a full mouthful was allowed as often as the sufferer would require, I am quite satisfied every endeavour for his recovery would be rendered ineffectual. In order to satisfy in some degree the inordinate demand for liquids, I therefore gave him the cold water, sometimes with brandy in it, by tea-spoonfuls only at a time, occasionally moistening the lips by means of a feather dipped in it; and at other times making him suck up the liquid through a straw. When by these means I procured for my patient a half hour's cessation from vomiting, I considered the symptoms as yielding, and almost certain of being subdued, so that within the

hour all the horrors of my patient's situation were overcome.

After the sparing use of liquids for the first hour, I gradually rose to mouthfuls, and by the expiration of a second, the patient was permitted the free use of panada, with a little brandy in it, which, together with different gruels, made the principal part of his nourishment during the first twenty-four hours. Sometimes the vomiting and purging would return after the exhibition of the opium, but seldom lasted long if you were sure the dose remained, and which indeed it is very difficult to bring up again, from its smallness eluding the contraction of the stomach in the action of vomiting. But it sometimes happened the patient had been swallowing immense draughts of liquid immediately before the opiate was taken, in which case, the action of vomiting generally returned before the pill could take effect, and then I immediately gave another, whether I was able to detect or not that the opiate had been rejected.

When the opium was given with a certainty that the stomach was empty, with the

subsequent mode of managing the drinks, I was never disappointed in relieving my patient. The muscles affected with spasm were immediately rubbed with the embrocation, and fomentations or warm substances were applied to the stomach and feet, and at the distance of two hours from the exhibition of the opiate the mixture was given. Whenever the symptoms were once subdued, they seldom relapsed to any extent, or if they did, they were easily conquered. For a day or two afterwards, the bowels showed a tendency to diarrhœa, or, more properly speaking, were easily excited, and the dejections seemed bilious.

Having now, Sir, detailed the mode in which I successfully combated the disease of Cholera, as it presented itself to me in the autumns of 1796, 1798, and 1800, and which was equally efficacious in less extensive epidemics which have occurred during warm seasons since then, (a considerable number having shown themselves ~~this~~ last autumn,) I shall now proceed cursorily to examine the practice which was adopted in our eastern dominions.

The great variety of means, opposite in nature and operation, which were employed by the medical profession in India, in their endeavours to combat this dreadful disease, forcibly suggests to my mind the preponderating and undue influence which preconceived opinions are allowed to exert over the human mind, and the urgent necessity which calls upon us to prevent our judgments being warped by mere doctrines, whether these have been suggested by our minds or inculcated by others ; while we should narrowly scrutinize, and vigilantly attend to every appearance of diseased action, and so endeavour to form a correct diagnosis, from the dictates of our own experience.

It seems impossible, Sir, to suppose, but the disease of spasmodic cholera must have existed in India from time immemorial, because, both the remote and predisposing causes must naturally have been in constant operation there ; the consequent deduction from which is, that it must have shown itself there ever since the original settlement of the British. This being the fact, how comes it, that the whole profession seemed taken so complete-

ly unawares, on the breaking out of the late severe and extensive endemic ? There was not one who did not seem to think the exciting cause consisted in an excess and vitiated state of the bile, with congestion and obstruction about the stomach, liver, and intestinal canal ; and notwithstanding the situation of the patient most clearly evinced, that, if evacuation had not already gone on to the extent of carrying away all offending matter, it had at least existed to the extent of reducing the patient to a moribund state, so that necessarily, every further effort in that way must not only be useless, but likely to be attended by results the most fatal. Notwithstanding, however, these very obvious conclusions, evacuants of every description were deemed absolutely necessary. All seemed to think the disease required no treatment different from the other bilious fevers and disorders of the climate, nor was it till after the most distressing circumstances had taken place, that the use of opium in all its variety and forms was *stumbled* on. I think, Sir, that I am fully justified in using the term *stumbled*, because, after having in almost every instance

failed in relieving the patient until the anodyne was exhibited, and by some means or other made to remain upon the stomach, either in a liquid or a solid form ; yet still, they seemed scarcely to perceive that opium ought to be considered their sheet-anchor in the management of this disease, and clung to the old idea of its being at the same time necessary to clear the system from a load of bile ; hence, we see large doses of calomel, and almost every other cathartic in the *Materia Medica*, had recourse to—emetics are strongly recommended—even copious blood-lettings are had recourse to—nor is the fatiguing remedy of the warm bath forgotten.

At first sight, indeed, the warm bath might appear a thing worthy of trial ; but when we take into consideration the exhaustion, and the restless anxiety of the patient, together with the uniform increase of spasm on the least motion, it comes to appear a very doubtful remedy indeed, and, accordingly, we find such conflicting and opposite accounts of its effects reported, as fully to justify its being laid aside as an approved means of cure.

It is really very extraordinary that the necessity for the discharge of bile should have, in this disease, seemed such an imperious indication. If any offending cause had been taken into the stomach, or deposited from any excretory ducts, it is highly probable such cause must have been carried off during the excessive and long continued evacuations ; or even allowing that it was not, surely the patient's state of distress and debility should have put an end to the idea of promoting these discharges, and taught the propriety, more especially, of not using active means to increase them, as they could be considered from their effects in no other light than the most dangerous and alarming diseased actions. Besides, I have repeatedly seen cases, where vomiting and purging, whatever had been the primary cause, were, after having existed for some time, to be considered only as increased actions continued from irritability, or sympathetic habits, long after the offending cause was removed. Accordingly, all evacuants were uniformly found not only useless but noxious, until combined with the opiate, and

made by some means or other to remain upon the stomach. If this was really the case, upon what grounds should these remedies be persevered in? In fact, they almost still counteracted the good effects of the opium; and had it not been from the overwhelming power of the extensive dose of the anodyne, still no benefit would have been obtained. But how, Sir, it should have happened, in such a state of exhaustion, that such remedies as bleeding and purging could have been thought of, is to me astonishing. It seems to me, no means more pernicious could have been thought of, the situation of the wretched sufferer appearing to require, that the remaining vital powers should be cherished, coaxed, and managed with the greatest delicacy.

With regard to the use of stimuli, such as ether, nitrous ether, ammonia, camphor, spices, oil of peppermint, &c. &c. I can declare, from experience, that they will all be found not only useless in putting an end to the irritability of the stomach, but will always be found, from their peculiar flavour, to increase the action of vomiting, and, con-

sequently, can do no good in recruiting the exhausted patient. The use of any plain ardent spirit, diluted with water, will in almost every instance be found the most effectual and grateful stomachic; but even this must be given in the quantities already mentioned, otherwise it will be rejected. In a word, the whole mystery in the treatment of this disease was the getting over the anodyne in the form which would remain, and positively prohibiting the use of any liquid whatever, except the very smallest quantities; when the cure will be speedily effected, not even excepting, which is really remarkable, the return of the pulse to the natural state in the course of a very few hours.

I have already mentioned that I prescribed, chiefly as a placebo, a mixture of Carb. magnesia, or Magnesia usta, and Aq. laur. cinnamomi; and even this I never saw retained upon the stomach until the opiate had taken effect; but I may here observe, no medicine will be found more effectual than this in allaying vomiting, when opium is either inadmissible, or its use doubtful; though I generally find that plain cold water forms the best

vehicle for giving it in. As to glysters, I gave them up altogether, for I never could obtain any benefit from them.

I have already observed, that an emetic in a case of cholera was given, the consequence of which was the death of the poor patient in a very short period thereafter ; and I will venture to assert, that the administration of emetics, under such circumstances, must either terminate in similar consequences, or operate in rendering the disease so untractable, as that the chance of saving the patient will be very much diminished. So thoroughly am I convinced of the baneful effects of emetics, given in cases of retching, accompanied with diarrhoea, and where evident signs of exhaustion are perceptible, that I use the greatest caution to prevent such an occurrence.

With regard to bleeding in this disease, we cannot be surprised at the opposite opinions entertained concerning its effects, though I think there ought to be only one feeling, and that is, that it cannot be of any use ; nor is it the least extraordinary circumstance in the eastern practice, that while acting on the

principle of subduing inflammatory action and congestion by the free use of bleeding, purging, &c., these were coupled with the strongest stimulants. Besides, the situation of the patient, where the characterizing symptoms of cholera present themselves, indicates such evident appearances of exhaustion, as to excite immediate horror and alarm; and approaches, as I have already remarked, to that state of collapse, which is produced by hypercatharsis, and points out any other treatment but the lancet. Indeed, from Dr. Burrel's own words, I may venture to say, that unless it was employed at the very commencement of the attack, it would be impossible to procure a tea-spoonful. But when we allow that the description given by some of these gentlemen constitutes cholera, we shall cease to be surprised, either that such a remedy was employed, or when employed, that it had proved beneficial.

I shall, Sir, conclude my observations upon the treatment of this disease, by again repeating my conviction, that, regarding the history of cholera by the medical profession in India, there can be no doubt the disease assumed its

fatal form from the erroneous indication for evacuants, also by persevering in giving the opiate in a liquid form, and the not enforcing an abstinence from fluids. I may also observe, that a free use of calomel and laudanum conjoined in large quantities was resorted to ; and, if I understand the account correctly, these medicines seem to have been given actually mixed together, by which means, the opiate came to be almost in the shape of a solid, and consequently, was attended almost with the same benefit as if it had been so, and given without the calomel.

Little additional light has been thrown on this disease from an inspection of the bodies of such as have fallen a sacrifice to it. Indeed, this was scarcely to be expected, as the phenomena of the disease, and the remedies which arrest it, could not warrant such an anticipation ; accordingly, any changes from a sound and healthy state which were observed in the cavities of the cranium, thorax, and abdomen, can be satisfactorily accounted for from the long continued excess of retching, purging, and spasm, such as effusion, rupture, collapse, or congestion. But the gorged

state of the liver, the distended gall-bladder, together with the contracted and empty state of the urinary bladder, which were uniformly found to exist, especially the last, can be readily explained; the two former arising from the increased secretion of the biliary system, peculiar to warm climates, together with the obstruction of the biliary duct by spasm, and the last from the complete abstraction of the fluids of the system, which I have frequently seen in this and similar states of sudden exhaustion from evacuations by stool; under which circumstances not a drop of urine was passed for forty-eight hours, the absorbents and lacteals rapidly imbibing every particle of liquid to restore the universal and sudden collapse.

Were we, Sir, to give full weight to the diversity of accounts which have reached us from India regarding the phenomena of this affection, we would certainly find it an extremely difficult undertaking, to form any diagnosis concerning it; some being of opinion that vomiting and purging constitute this disease, when these are accompanied with spasmodic action of the muscles, which

they contend occur in every case; others again, that the spasms are only incidental, and are frequently absent, *that so also are the vomiting and purging, and yet the disease of cholera spasmodica existing in great violence; nay, indeed, that the worst cases are those, wherein neither of the characteristics of the disease present themselves !!!*

I beg leave to ask these gentlemen how we are to understand such descriptions, more especially when they offer us no remarks tending towards an explanation. In the first place, I think we cannot be wrong in asserting, that cholera cannot exist where vomiting and purging do not present themselves, and if these evacuations are not accompanied by, or soon followed with spasms, especially of the lower extremities, together with great exhaustion, the disease cannot be cholera spasmodica, and the mode of treatment, of course, no longer the same.

From the whole tenor of those observations which I have already made, it will readily occur to you, Sir, that I consider the cholera spasmodica of India to be exactly the same as the cholera, or cholera morbus, of

more northern latitudes; and from the predisposing, remote, and occasional causes, as well as the symptoms and most successful treatment, there do not exist any rational grounds for a distinction, all the leading features of the disease, viz. vomiting, purging, and spasm, with great exhaustion, being present in each. Nor have the symptoms or situation of the patient the smallest resemblance to what occurs in biliary fevers of any description, for in such, the excessive headach, flushed countenance, great heat of skin, frequent hard pulse, vomiting of dark coloured bile, and total want of purging, ghastly features, spasms, cold extremities, and utter exhaustion, constitute a most decisive difference, and indicate a method of treatment quite opposite. Even the symptoms arising from accumulation of bile, without any connection with intermittent and remittent fever, and accompanied with headach, flushed countenance, excessive retching, and tenesmus, have no affinity to the disease whatever, all the characteristic symptoms being wholly absent, and no indication of cure presenting itself but the most active purging. Indeed

I have, during this last summer and beginning of autumn, witnessed for the first time a very near approach to the bilious fever of warm climates. It made its appearance after the warm weather had continued about two months. The patient was suddenly affected with violent headach, vertigo, flushed countenance, burning heat of skin, furred tongue, quick hard pulse, together with great anxiety and oppression about the precordium. The number amounted to about thirty, and they were all cured but one, who had been ill about a week before I was called, at which time evident symptoms of effusion upon the brain had taken place; and notwithstanding copious bleeding with leeches, blister to the head, and purging, she only survived two days. All the others recovered under the same treatment, which was in general applied within twenty-four hours from the first attack.

But there is still another complaint, which we might here notice, as in some measure connected with this subject, I mean that affection of the epigastric region commonly called cramp, or a spasmodic affection of the stomach, which is attended with very violent

pain, sometimes accompanied by severe retching, sometimes not ; more or less headach ; frequently considerable dyspnœa ; and no evacuation by stool. This complaint I have very frequently met with, and can from experience assert, that it will never be cured by opiates. Indeed, if I mistake not, much mischief has been done by persevering in their use ; and many of the sudden deaths following such an affection appear to me to have been the result of administering this medicine. The most immediate and efficacious remedy will always be found in an emetic, composed of ipecacuanha and tartrite of antimony. By producing sickness, it soon eases the pain and other symptoms, and by emptying the stomach of its contents, generally puts an end to the complaint, which will be found in almost every instance to be occasioned by some offending matter taken into the stomach ; and the exhibition of a strong laxative in the form of pills, after the operation of the emetic, followed by an opiate, will remove the complaint.

As to making any distinction between the two diseases, from what has been stated by different authors concerning the nature and

appearance of the matter discharged by vomiting or stool, the thing appears ridiculous, and without foundation. On the contrary, both the European and Indian practitioners appear to coincide ; for wherever the description of the diseased actions makes a near approach to each other, the appearance of the matter ejected is described as exactly the same ; and it is only when the symptoms are moderate, that bile has been remarked in the discharges. But, independent of the very great probability, that the nature and appearance of the matter discharged would be but rarely examined, and then, perhaps, but very imperfectly ; and even in India, when the disease did not put on so unfavourable an appearance as it has lately done, little or no notice was taken of the total want of bile in the matter discharged, nor is there a doubt, that this peculiarity arises entirely from the severe spasmodic action being communicated to the stomach, duodenum, and biliary duct.

The cholera, as described by Celsus, Sydenham, Cullen, Cleghorn, and others, presents the very same train of symptoms for our consideration, but their mode of managing it is quite in opposition with the recent

views of the Indian practitioners ; the former trusting almost entirely to the sedative effects of opium, while the latter, never thinking of it, employ evacuants of every description, notwithstanding these being particularly condemned by such high medical authorities, no other countenance being afforded by them for such practice, unless the merely recommending the washing away of the bile by the use of diluents can be supposed to convey as much—a very mild and harmless practice when compared to the use of the most drastic purges. But here I must take the liberty to observe, that the use of diluents seemed to have been recommended from the idea, (and it is an erroneous one,) that it was still necessary to employ some means for the washing away of the offending matter ; whereas, it has been found, and indeed will uniformly be found, that the continuation of the action of vomiting and purging forms the grand source of all that is to be dreaded in this disease, and the patient cannot be recovered unless these actions are suspended and subdued, and the opinion must certainly be an unanimous one, that

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the swallowing of liquids in any quantity will, to a certainty, increase instead of alleviating the diseased action, without the cessation of which, the cure of the disease is a problem beyond the reach of my comprehension.

But to show still more clearly that the diseases of both countries are the same, and the idea of forming any distinction between them erroneous, the cholera never appears in northern latitudes except at those times of the year when our thermometers indicate an atmospherical temperature differing but little from that of India, and not until that temperature has existed for probably six weeks. Under these circumstances it is natural to suppose, that such sultry seasons with us should be followed by effects proportionably more severe, the change from cold to heat being at once more sudden and more excessive than it can be supposed to be in India, where the mean temperature of the season is fully equivalent to its production ; for even there the disease only becomes endemic from a sensible increase of heat ; the animal body always becoming less susceptible of

any disease from being constantly under the influence of the cause which is capable of producing it. Nor, finally, do I think the practitioners of India can be allowed the supposition of a different or more severe species of cholera; because the moment they fall upon the only remedy, however heterogeneously administered, the disease instantly lost its terrific appearance, and became nearly equally tractable. The old designations, therefore, of Cholera biliosa, or Morbus, or simply Cholera, are sufficiently distinctive as characterizing the disease; but, perhaps, that of Cholera mitior and gravior would be preferable, as comprehending all the peculiarities of the disease.

With regard to the prognosis, I can state from experience, that, where the symptoms of vomiting and purging are severe, and continue from half an hour to an hour, the spasms will make their appearance,—the climax of distress and misery is soon after attained, and, unless the diseased actions of the stomach and intestinal canal can be speedily put an end to, a general collapse of the system soon follows, and death ensues, even here, within the twenty-four hours. As to

the spasms leading to any additional danger, I have uniformly found them to be more or less severe in proportion to the extent of the purging and retching ; for, in mild cases, little or no spasmodic affection follows ; and, in general, wherever the spasms exist to a great degree, they are either a direct proof of the severity of the disease, or indirectly an evidence of the previous debility and irritability of the system, which comes indeed to very nearly the same thing. For I have constantly observed, that cholera was more frequent in languid, relaxed, and weakly habits ; and, in proportion to the degree in which this habit shows itself, so, in proportion will be the effect which the same extent of vomiting and purging will produce in bringing on cramp ; in other words, it will require, in different cases, a greater or less extent of these evacuations, to produce the spasmodic affection. Therefore, as the whole of the dangerous symptoms appear to be the direct consequence of the increased actions of vomiting and purging, we have every reason to conclude, if these actions can be suspended, even in the most desperate circum-

stances, the most favourable result may be expected; and this may almost universally be obtained, if the opiate should only be retained on the stomach.

With regard to the predisposing and remote causes of this disease, whether as occurring in northern or tropical climates, all are nearly agreed. One essential is necessary to the existence of cholera—which is, a greater degree of heat than is common at the warmest period of the year; nor will the endemic make its appearance till the atmosphere has been kept at that exalted temperature for probably a month or two, unaccompanied with rains, or these in a very sparing quantity; for I perfectly coincide with the celebrated Dr. Cullen in supposing, that a vomiting and purging at any other period has no connexion with this affection, and is not entitled to the same appellation.

In all probability, too, before cholera has shown itself, the constitution may have undergone, to a greater or less extent, the other changes consequent upon the effects of heat, as the prickly heat, swarthy complexion, yellowness of the eyes and skin, feverish attacks with headache, vomiting of variously-colour-

ed bile, loose state of the bowels, and fullness, accompanied with pain in the region of the liver ; from which indications it is evident, not only that a particular change must have taken place in the whole chylopoietic, and assistant chylopoietic viscera, but also, an irritability of nervous fibre, which predisposes to convulsions, tetanus, and spasm.

But the operation of heat, as predisposing to cholera, will be materially assisted, or greatly counteracted, by the absence or presence of particular circumstances—as a slender debilitated habit, a scanty or unnutritious diet, nearly a total want of animal food, exercise or labour, more especially in the open air, so severe as to produce fatigue, and excite copious perspirations, with the use of fruits and vegetables.

No age or sex is altogether exempt from cholera when the predisposing causes are favourable to its production ; but it is chiefly the adult state and males which are particularly obnoxious to its severe form ; and the higher classes of society, even in the army, together with those of a respectable rank, especially females, seldom suffer to any extent. Nevertheless, I am of opinion, no predisposing

cause exists, heat and fatigue only excepted, which operates so extensively in rendering the disease severe, as the want of a wholesome and nutritious diet. In every one of the seasons to which my personal experience has caused me to make reference, the comforts of the lower classes were very considerably abridged, from the high price of provisions, their general diet consisting of potatoes, herrings, and sowins, made from the ley of starch ; and their appearance more squalid, meagre, and feeble, than usual. As a farther proof of the exhausted state of this class, typhus was constantly showing itself in these years, and the remark is worthy of observation, that for the last twenty years it has not appeared here as an epidemic, which circumstance can only be attributed to the increased comforts of the labouring classes, which have also operated in rendering the appearance of cholera both rare and mild, although the heat of some of our seasons has, since these years, been very considerable.

These observations particularly apply to the last appearance of this disease in India, where, from scarcity, the army, with its numerous followers, and a great part of the natives, suffered most severely ; nor could the

distress and danger fail to be much increased by the fatigue, the exertions, and the privations, necessarily attendant on a campaign, where almost constant exposure to the influence of the sun becomes unavoidable.

The immediate result to which I was conducted, from the phenomena that offered themselves to my observation during the seasons already mentioned, appeared to me at the time satisfactory, nor has the farther experience of upwards of twenty years, and the balancing in my own mind of the accounts transmitted from India, afforded me any reasons for altering my opinion. When, therefore, we attentively review the history and supposed peculiarities of European and Asiatic diseases, we really can discriminate no difference but what results either from increased action of the liver, and actually increased secretion of bile, changed in its appearance or qualities; or a state of debility and relaxation of fibre; both states evidently accompanied with increased irritability of the nervous system: and these changes in the constitution seem to follow in a slow but steady ratio, proportionate to the length of time, and the degree of influence which a

heated atmosphere has been exercising upon the human body.

The mode in which excessive heat influences the human frame, appears to me, attributable to only two causes, which are, the effecting of the increased action of the whole vascular system, more especially the Vena Portarum ; and the excessivee vacuation and draining away of the fluids of the body by the general secretions, more particularly perspiration.

The very high temperature by increasing vascular action, may certainly be capable of producing an excited action in the liver, without the assistance which may be derived from copious perspiration ; but I apprehend it would be no difficult matter to show, that where the operation of heat upon the human body is not accompanied with this discharge, the consequences of such operation are either entirely avoided, or in a great measure obviated ; and as to the disease under consideration, I verily believe, that it would never occur, could the profuse perspiration be prevented from taking place.

On an attentive consideration, the diseases of tropical climates seem to arrange themselves into those of great general vascular

action throughout, those commencing in the type of synocha and ending in typhus; or those of debility from the outset. To the state of relaxation and debility only, would I refer the origin of Cholera, but more especially that of Cholera Gravior, because, from a minute examination of its history, I apprehend it will be found, that, together with the circumstances already mentioned, the natives of warm climates are but rarely affected with the fevers and other violent disorders originating in the altered secretions of the liver, or organic derangements of that viscus, owing, doubtless, to their being habituated to the climate, and to their simple mode of living. But let it be observed, that wherever any considerable rise of temperature takes place, accompanied with the predisposing causes which we have already alluded to, and to which they are more especially exposed, from the want of tone, and debilitated state of their habits, they are rendered particularly liable to the attacks of cholera in its most severe and fatal form.

Independently, however, of the very great difference in the symptoms which we have already remarked, as pointing out the opposite states of the system, by which it is ren-

dered liable to the two opposite classes of disease, none more strongly mark such difference, than the affections of the brain and nervous system. In those dependent on vascular excitement, delirium, stupor, and coma are frequently present, and the clonic and plastic affections of the muscles are chiefly, if not always, confined to the trunk and superior parts of the body ; whereas, in those characterized by debility, as in this disease of cholera, no affection of the brain exists, and the spasmodic actions are of a peculiar kind, best known under their vulgar name of Cramp. Nor is the strongest evidence wanting, that in cholera the particular state of the system originates from debility, and consequently indicates an essential difference between the states of habit necessary to the production of the two classes of disease, this particular affection of the muscles only existing, where there is the most distinct evidence of debility, either local or general ; that is to say, cramp is frequently to be met with in slender or weakly habits ; it is a complaint peculiarly incidental to females ; it is very common in women during the period of gestation ; it very often occurs

after violent exertion of the lower extremities, such as dancing, leaping, running, or long continued walking, and is a frequent complaint with weavers, blacksmiths, laundry-maids, &c. ; and, after fevers, or during convalescence, from complaints causing debility, its occurrence upon exercise is exceedingly frequent. The reason for the lower extremities being particularly prone to this affection is probably to be accounted for, not only from their always having undergone more exertion, and consequently exhaustion, than any other part of the body, but from their greater distance from the source of nervous influence.

Upon a consideration, therefore, of the whole of these circumstances, we may perhaps safely attempt reaching the proximate cause in the following manner: The system, when in the state we have described, may not unaptly be compared to an electric body positively or negatively charged, and nothing is awanting for the production of disease, but the application of an exciting cause, on the nature of which cause, and the prevailing predisposition of habit, the particular kind of disease depends. If the system is posi-

tively charged, or, in other words, if an inflammatory diathesis prevails, then, on the application of marsh miasma, of cold, of wet, of great fatigue, or if offending matter is taken into the stomach, we have intermittent, remittent, and continued fevers, dysentery, rheumatism, hepatitis, and violent bilious attacks: but, on the contrary, if the system is in a negative state, in other words, if a debility of the living fibre or typhoid diathesis prevail, then any offending matters taken into the stomach, also violent exertion, and perhaps exposure to cold and damp will excite cholera, whether in its milder or more aggravated shape, that is, severe vomiting and purging, attended with violent spasms in the muscles of the extremities, soon followed with extreme debility and collapse.

If these increased actions are neither very violent nor long continued, bile is generally mixed with the egesta, and exhaustion or cramp is scarcely observable; but if the vomiting and purging are excessive, then a spasmodic action affects the epigastric and hypochondriac regions, no more bile is now visible in the ejected matter, nothing being discharged by stool or vomiting but an ill-coloured whitish matter resembling yeast, and

not unlike the contents of the stomach when examined after the food has undergone the process of digestion, and that viscus nearly empty. It is now that the situation of our patient becomes striking and alarming, for the whole vital energy seems gone, the eyes are sunk and hollow, the pulse becomes rapid and feeble, the exhaustion is extreme, and the general state of collapse threatens immediate dissolution; nor can you learn that there is any nervous energy or vitality remaining, except from the agony excited by the spasmodic affection of the muscles, which has now extended itself to the lower extremities.

From this view then, it would appear, that the disease of cholera ultimately consists in an increased irritability of the nervous system, and more especially of the great sympathetic nerves, followed, on the application of an exciting cause, by violent increased action of the stomach, alimentary canal, diaphragm, and adjacent parts, ending in spasmodic affections of these parts, which soon produce consequences under which the whole system suffers. That this state is ultimately purely nervous, and destitute of excitement from

any remaining accumulation of bile, or other offending matter, is, independent of all reasoning, proved by the whole train of symptoms being instantly and permanently relieved, only, by the sedative effects of opium.

The only remaining peculiarity in the train of symptoms of cholera gravior deserving of notice is, the very rapid sinking of the strength, great exhaustion, and general collapse. These consequences distinctly prove, that the general mass of fluids are more especially exhausted, and as there are no other visible means of waste, but from the ejections by vomiting and purging, the matter so discharged must not only be the evacuation of all fluid matter, of whatever kind, which is lodged in the stomach and alimentary canal, but must also be drawn from the whole of those fluids upon which the plumpness, nourishment, and vigour of the body depend, by the extraordinary action of the whole absorbent system, and also, if such an occurrence is possible, by a retrograde motion of the lacteals.

We are now, Sir, arrived at the much disputed point among the practitioners of India, whether or not the cholera, which has

lately appeared in that climate, is capable of propagating itself, by means of the effluvia or other matter emanating from the bodies of those labouring under that disease.

You will, no doubt, Sir, have noticed, that throughout these observations, I have made use of the term *Endemic* in a sense different from that which it is usually understood to imply. It will readily be allowed by all, that much confusion has arisen from the vague manner of employing words in attempts at arranging diseases, according to the powers supposed to produce them, or to those which they possess of extending themselves; and it is greatly to be wished, that some plan were adopted, affixing a definite and standard signification to their employment in medical writings.

The term *Endemic* has hitherto been principally used for denoting a disease, supposed to be confined to particular districts of country, such as the *Goitre* in parts of Switzerland and Derbyshire, *Cretinism* among the *Alps*, &c. &c. This use of the word I would propose to be laid aside entirely, as not being fairly deducible from its etymology, because those diseases, or a predisposition to them,

(such as is the case in small-pox, measles, &c.) cannot be supposed to have been originally latent in the body, but must certainly proceed from causes connected with soil, climate, and food. To this class of diseases, therefore, I should propose to apply the term Indigenic, while I should restrict the word Endemic, to diseases originating in atmospherical causes, or such as are entirely external to the body, and producing effects upon it, not capable of propagating themselves. In this sense I apprehend the term, so defined, will readily embrace intermittent fever, cholera, some kinds of influenza, dysentery, ophthalmia, &c. I shall not, however, trouble you, Sir, or myself, by examining how far these different diseases are entitled to have the term Endemic, as thus defined applied to them, but shall briefly state my reasons for including under it intermittents and cholera.

Dr. Mason Good has with much ingenuity laboured to show, that there are actually no just grounds for making a distinction betwixt the fevers arising from marsh miasma-ta, and those which put on the continued form, because, although the marsh miasma

has been generally considered only as the effluvia of putrid vegetable matter, it is also evident, it must be strongly impregnated with those of putrid animals; that the intermittent and continued fevers have been occasionally produced from the same causes, and found capable of reproducing each other; and further, that it entirely depends on particular states of the body, and particular states of the miasma and its application, which species of disease is generated.

In opposition to such high authority, it appears to me to be quite obvious, that some essential difference exists. In the first place, It may be observed, that the effects resulting from the application of marsh miasma, are identically the same both in the climates of Europe and Asia; the experience of practitioners in either quarter of the world going to establish this fact.

In the second place, Wherever great agricultural improvements have taken place, and the grounds been thoroughly drained, intermittent fever has entirely disappeared, and with regard to this fact, as connected with the topography of Musselburgh, I can state, that it is distinctly within my own knowledge, we were visited with intermittents every spring

and autumn so regularly, and so severely, that the operations of the farmer were not unfrequently suspended from want of hands, and it is now nearly forty years since agues were known in this place.

In the third place, It is only in districts of country exhibiting particular local peculiarities that the intermittent is known—more especially endemically ; but continued fevers are found in all situations.

Fourthly, Whole districts of country have been seen to exert the same effects over the human body from times immemorial.

Fifthly, Continued fever, more especially the typhoid, still maintains its ground in those situations, from which the other has totally disappeared.

Sixthly, The phenomena and symptoms of intermittent and continued fever are strikingly different, as well as the method of cure.

Seventhly, So seldom have intermittents been supposed, or said to have extended themselves directly by contagion, that we may presume they never do so ; it being more probable that some mistake must have been committed, than that Nature would infringe a rule apparently so general.

Eighthly, The effluvia emanating from the human body under the influence of any species of the continued fever have also been found to maintain the same universal uniformity in their effects, by their never producing the intermittent.

Ninthly, It has never been observed that the attendants upon those afflicted with ague, or any inmates of the same dwelling have been affected with the disease, provided they were not exposed to the same circumstances that generated it.

And, lastly, All these facts are general in their tendency, and admit of common application to intermittent fever all over the globe.

With regard to cholera, I think it will appear after an attentive review of the preceding pages, there are the strongest reasons for concluding, that no particular regimen, or external application of circumstances can produce the disease, without a very considerable increase of heat, and long continued application of it to the system ; that the effects of heat here seem to produce no organic or permanent change upon any part of the human body ; that heat requires no external adjunct for producing this disease ; that it occurs in

all situations and climates, and that, like all endemics, as we have defined the term, it appears in every direction at once, never gradually radiating from a centre to a circumference; that the symptoms which constitute the disease have no determinate period of existence, but may exist either for six hours or for forty-eight, while the most distressing and dangerous appearances may disappear in an hour or two from the exhibition of the opiate, and in four or six hours from the commencement of the attack, the patient who was considered moribund, will be completely convalescent.

Besides these striking facts, I have already noticed with regard to intermittents, that no one will assert he ever saw any case of cholera extend itself to the inmates of a house, who have not been exposed to the same circumstances which originally excited it. I have already said this disease particularly affects such as are exposed to privations and fatigue in the open air; now, supposing a person in such circumstances to be seized with cholera, and placed in a situation where he is attended only by those who have not at all been exposed to these influential causes,

then none of such attendants will be affected with the disease. The fact too, that cholera makes its appearance in a corps, and to a considerable extent in one night, and after continuing for a short time, should entirely cease, then again after a few days should return, attacking such as had not previously suffered from it, shows in the clearest and most positive manner, the disease is neither epidemic nor contagious. From the previous history of the disease this fact admits of a ready explanation, for it is easy to suppose that when a regiment has been exposed to all the predisposing causes of the disease, such as a fatiguing day's march, or drinking, or eating a hearty meal, and exposure to the cold and damp of the evening, all such as are particularly predisposed will be attacked with cholera during the night, and a considerable number are also likely to be seized in the one or two succeeding days. But if the regiment continues for a few days longer exempt from fatigue, and has a comfortable diet, the disease will then suddenly disappear, and will not return again in that corps, until the remote and occasional causes of fatigue and privations again come to operate. The mode

in which it has been described, as extending its ravages from post to post, is also another proof of the fact ; because I suppose that, by these posts are meant, the military which remain, and do necessary duty ; all of which, we may conclude, have been completely under the influence of the predisposing, and very likely under that of the exciting causes also. That fact, too, which has been considered as the most extraordinary, and supposed by some as distinctly marking the contagious nature of the disease, the making of its way against the most violent monsoons, I am inclined to consider as of little consequence, as it readily admits of explanation. Let it be observed, this fact applies strongly to those diseases which are confessedly epidemic, for the monsoons ought, and always have been known to check their progress ; for it will be recollectcd, that cholera will make its appearance in every district and situation indiscriminately, only allowing the essential cause of increased temperature has existed ; and I apprehend it will readily be conceded, that this is a circumstance pretty universal in its occurrence under the climates of India.

But, though the occurrence of the monsoons ought, and will always have a very sensible effect in checking the spread of cholera, still it neither can, nor does so effectually annul the contracted predisposition, but that the disease makes its appearance to a greater or less extent in those particularly exposed to its exciting causes, or that it so far changes the direction of the battery of symptoms as to introduce an almost entirely new disease; and this disease seems more to resemble dysenteria than cholera spasmodica; for the violence of the vomiting and retching is much circumscribed, the dejections by stool are trifling, accompanied with severe griping and tenesmus, but with little or no cramp, and very moderate prostration of strength. This very sudden change from cholera to dysenteric symptoms I have repeatedly observed, from the weather becoming wet and cooler, and the whole plan of treatment so completely changed, that purgatives become the only medicines capable of relieving the patient.

Indeed, it is from the very great diversity of climate, situation, and other circumstances, the prodigious contradiction and variety of

the symptoms, as they have been lately described in India, as well as the treatment of the disease, is to be accounted for ; nor have I a doubt it will afterwards be found, if strict attention is paid to the discrimination of these circumstances, that the whole phenomena, which have been considered so singular and remarkable, will entirely disappear, and the cholera of India will assume as steady a character, and perhaps will be as easily managed, as that of any other climate.

From these observations then, I think there can be no doubt that, if any medical fact can be considered as ascertained, that of including intermittents and cholera under the term endemic, as we have defined it, can admit of no doubt ; and therefore, those diseases which propagate themselves by their effluvia emanating from the human body,—such as pestis; small-pox, measles, hooping cough, scarlatina, and the different species of continued fever, will clearly fall to be included under the title of epidemic. Perhaps, too, by altering the terminations of the words endemic and epidemic into endemial and epidemial, a less extensive signification of

the terms might, when necessary, be conveyed to the medical reader.

For the better elucidation too of medical writings, it is much to be wished that appropriate definitions were attached to the words contagion and infection ; which, though certainly entirely distinct in their etymologies, are often used almost synonymously. In attention to this, and to obviate the obscurity which it frequently occasions, I should propose, that infection and infectious be only applied to diseases not depending on a derangement of the vital functions, and conveyed in as material and tangible a shape as possible, such as psora, lues venerea, and other distempers communicated by direct contact or inoculation ; and should only employ the terms contagion and contagious where they can be coupled with the adjuncts of endemic or epidemic, or, in other words, to diseases propagated by a vitiated state of the atmosphere, whether that may have primarily arisen from marsh miasma or diseased human effluvia.

It now only remains we should notice those means that may be adopted by way of pre-

vention ; but I am afraid, although the disease admits almost of a perfect antidote, little benefit can be in reality obtained, there being such a numerous class of society whose necessary avocations expose them to the influential causes, and, consequently, always present a very extensive field for the operations of the disease. In India this must more particularly be the case, where the army, with its numerous and motley followers, together with the labour and scanty nourishment of the natives, afford not only ample opportunities for its occurrence, but also sufficient reasons to account for the severity of its attack ; but it appears to me very evident, that, were it possible to avoid fatigue, to keep sheltered and protected by cover during the excessive heats, to have a nourishing and abundant diet, avoiding much use of fruit and vegetables, and the allowance of a moderate quantity of wine or diluted spirits, together with a proper attention to the state of the alvine discharge, the disease would never present an aspect so extensive and terrific as it has done during late years in British India.

I have now, Sir, brought to a conclusion those observations which my own experience, and the accounts transmitted from our eastern dominions concerning this disease, have suggested to my mind. If they shall be found to point out any improvement in the treatment, or throw any new or additional light on the nature of cholera, I trust I shall have done my duty in offering them to your notice.

I am,

Sir,

With the greatest respect,

Your most obedient servant,

THOMAS BROWN.

Musselburgh,
Dec. 1, 1824.